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10/537,417	06/02/2005	Kimiyasu Satoh	267653US6PCT	6457
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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER				
CHOWDHURY, AFROZA Y				
ART UNIT		PAPER NUMBER		
2629				
NOTIFICATION DATE		DELIVERY MODE		
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com
oblonpat@oblon.com
jgardner@oblon.com

Office Action Summary

Application No.

10/537,417

Applicant(s)

SATO ET AL.

Examiner

AFROZA Y. CHOWDHURY

Art Unit

2629

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 January 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-946)
- 3) ☐ Information Disclosure Statement(s) (PTO/SG/US)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. Applicant's amendment received on **January 20, 2008** has been entered. Claims 1-12 are currently pending. Applicant's arguments are addressed herein below.
2. JP references in IDS are not considered since English translation is not provided.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-7 and 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Shigeki et al.** (JP Pub. 2002-259095) in view of **Yoshitaka et al.** (JP Pub. 11-212725) and in further view of **Divigalpitiya et al.** (US Pub. 2003/0205450).

As to claim 1, Shigeki et al. discloses an input apparatus that outputs coordinate values of an operation surface that the user has pressed as an input operation ([0040]), deforms the operation surface (fig. 6), and causes the user to feel a force sense as a feedback with the deformed operation surface ([0040]), comprising:

a deformation mechanism portion that deforms the operation surface (fig. 6);

a press force detection portion that detects whether the operation surface has been pressed ([0040]); and

a control portion ([0046]) that controls said deformation mechanism portion to start driving the actuator to gradually deform the operation surface in one direction and then in the reverse direction ([0040]).

Shigeki et al. does not explicitly teach the control portion that controls a piezoelectric actuator and period for deformation in one direction is larger than in the reverse direction.

Yoshitaka et al. teaches a control portion ([0020]) that controls deformation mechanism portion to start driving the piezoelectric actuator to gradually deform the operation surface in one direction and then in the reverse direction ([0050] – [0051], [0001] – [0002]), and

a piezoelectric device that detects an operation input position (abstract, [0126] – [0128]).

Yoshitaka et al. does not teach whether the piezoelectric element is a bi-morph device.

However, it is well known in the art that most piezoelectric actuators are composed of piezoelectric bi-morph device.

Therefore, it is obvious to one skill in the art at the time of the invention was made to include the piezoelectric element of Yoshitaka et al. into the input device of Shigeki et al. to make a piezoelectric actuator in order to let user feel a force sense as a feedback and detect an operation input position.

Shigeki et al. (as modified by Yoshitaka et al.) does not teach a period for which the operation surface is deformed in one direction is sufficiently larger than a period for which the operation surface is deformed in the reverse direction when said press force detection portion detects that the operation surface has been pressed.

Divigalpitiya et al. discloses the period for activate the operation (surface is deformed) in one direction is sufficiently larger than the period for which the operation surface is deformed in the reverse direction (restore the original position)(page 3, [0033]).

Therefore, it is obvious to one skill in the art at the time of the invention was made to combine the pressure activation device of Divigalpitiya et al. with the input device of Shigeki et al. (as modified by Yoshitaka et al.) to make a piezoelectric actuator in order to allow user to feel a click sense as a feedback with maximum deformation amount of the touch panel and low power consumption.

As to claim 2, Shigeki et al. (as modified by Yoshitaka et al. and Divigalpitiya et al.) teaches an input apparatus with the period for deformation in one direction is larger than in the reverse direction)(page 3, [0033], in Divigalpitiya et al.).

Shigeki et al. (as modified by Yoshitaka et al. and Divigalpitiya et al.) does not teach the maximum deformation amount of the operation surface.

However, it is obvious for an input apparatus when the maximum deformation amount of the operation surface deformed by said deformation mechanism portion is

200 micro-meter or less, the period for which the operation surface is deformed in one direction is 33 times or more than the period for which the operation surface is deformed in the reverse direction.

As to claim 3, it is obvious for an input apparatus wherein the period for which the operation surface is deformed in the first direction is 200 msec or less.

As to claim 4, it is obvious that an input apparatus comprising:
a deformation amount set portion that sets the deformation amount of the panel surface corresponding to setting of the user,
wherein said control portion deforms the operation surface corresponding to setting of the deformation amount of the operation surface.

As to claim 5, Yoshitaka et al. discloses an input apparatus wherein said control portion gradually increases or decreases a drive voltage of the piezoelectric actuator always corresponding to the same waveform and varies the period for which the drive voltage increases or decreases corresponding to the waveform to vary the deformation amount of the operation surface in one direction ([0024] – [0025]).

As to claim 6, it is obvious that an input apparatus wherein said control portion controls said deformation mechanism portion to keep the operation surface deformed in the reverse direction until said press force detection portion detects that the operation

surface has been pressed.

As to claim 7, it is obvious for an input apparatus wherein said control portion controls said deformation mechanism portion to deform the operation surface in the reverse direction for a predetermined period and the operation surface for a period sufficiently longer than the predetermined period so that the voltage applied to the piezoelectric actuator becomes 0 V when said press force detection portion detects that the operation surface has been pressed.

As to claim 9, Yoshitaka et al. discloses an input apparatus comprising: a display portion that transmits the operation surface and displays a screen, wherein when an operation function item displayed on said display portion is pressed through the operation surface, the operation function item is selected and input ([0010]).

As to claim 10, Yoshitaka et al. teaches an input apparatus relates to a portable electronic apparatus ([0001]).

As to claim 11, Yoshitaka et al. teaches an input apparatus relates to a remote control apparatus ([0001]).

Claim 12 is rejected the same as claim 1 above.

7. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Shigeki et al.** (JP Pub. 2002-259095) in view of **Yoshitaka et al.** (JP Pub. 11-212725) and in further view of **Divigalpitiya et al.** (US Pub. 2003/0205450) and **Wu et al.** (US. Patent 6,422,757).

As to claim 8, Shigeki et al. (as modified by Yoshitaka et al. and Divigalpitiya et al.) teaches an input apparatus with spacer (see [0009] – [0010] in Shigeki et al.).

Shigeki et al. (as modified by Yoshitaka et al. and Divigalpitiya et al.) does not explicitly introduce a piezoelectric actuator with first, second, and third spacers.

Wu et al. discloses a piezoelectric actuator with three spacers (col. 3, line56 – col. 4, line 14).

Therefore, it is obvious to one skill in the art at the time of the invention was made to use the idea of Wu et al. of using more than one spacer to make a piezoelectric actuator with the input device of Shigeki et al. (as modified by Yoshitaka et al. and Divigalpitiya et al.) to make a piezoelectric actuator with the desired arrangement of spacers in order to create gap.

Also, it is a design choice to make a piezoelectric actuator that is curved in the direction perpendicular to the surfaces on which three spacers are disposed so as to vary the distance between the front surface of the first spacer and the front surface of the second and third spacers and deform the operation surface.

Response to Arguments

8. Applicant's arguments filed **January 20, 2008** have been fully considered but they are not persuasive.

Applicant argues that Shigeki et al. does not teach a control portion that controls the deformation mechanism portion to start driving the piezoelectric actuator to gradually deform the operation surface in one direction and then in the reverse direction.

The Examiner respectfully disagrees. Shigeki et al. (as modified by Yoshitaka et al.) discloses a control portion ([0020]) that controls deformation mechanism portion to start driving the piezoelectric actuator to gradually deform the operation surface in one direction and then in the reverse direction ([0050] – [0051], [0001] – [0002], in Yoshitaka et al.).

9. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AFROZA Y. CHOWDHURY whose telephone number is (571)270-1543. The examiner can normally be reached on 7:30-5:00 EST, 5/4/9.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bipin Shalwala can be reached on 571-272-7681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AC
3/15/2008

***/Bipin Shalwala/
Supervisory Patent Examiner, Art Unit 2629***